

REMARKS

Claims 1-20 were presented for examination in the present application and remain pending upon entry of the instant amendment.

Claims 1-14 and 16-20 were rejected under 35 U.S.C. §102(b) over DE 19920299– English equivalent U.S. Patent No. 6,711,713 (Rumpler). Claims 1, 2, 11 and 15 were rejected under 35 U.S.C. §102(b) over U.S. Patent No. 4,652,776 (George).

Applicants traverse the assertion that Rumpler anticipates all the limitations of claims 1 and 11, and claims dependent therefrom.

Claim 1 requires “detecting two or more process signals redundantly; identifying an event that is relevant to system safety; and converting said process signals to a single process signal for further system-based processing to carry out the logic operations on a single-signal basis for identifying said event.”

Claim 11 requires “a plurality of process signals being supplied on two or more channels and detected redundantly for system safety; and a converter for conversion of process signals to a single process signal, said single process signal being capable of being transmitted via one channel, to carry out the logic operations on a single-signal basis to identify said event.”

Applicants contest the interpretation of Rumpler that was provided in the Office Action. Rumpler describes a process using a radio path or link. A radio path or radio link is not analogous to a single signal. The Office Action has incorrectly analogized a radio link or path to a signal. Rumpler references a radio link (col.5, line 9) or a radio path (col. 6, line 11) with the reference letter “F”, but never explains that “F” is a signal as argued in the Office Action. Without this explicit teaching or even the implication that “F” refers to a signal, Applicants submit that the entire premise that is the foundation of the

rejection of claims 1 and 11 is erroneous. Both claims 1 and 11 specify that the invention converts multiple process signals into a single process signal.

This is a significant difference because a single radio link or path "F", as disclosed by Rumpler, can be transmitted by more than a single signal. Hence, a single radio link or path can not be compared to the single signal as used in claims 1 and 11.

The Office Action submits that col. 6, lines 6-11 and lines 20-22 of Rumpler discloses the step of converting the process signals to a single process signal for further system-based processing.

The passages cited in the Office Action only disclose that the data of each of the channels K1 and K2 are embedded within a data packet and the data packet includes an added redundant value for data protection. (e.g. claims 2 and 11). This data respectively combined within a data packet is fully described in the passage on col. 6, lines 19 to 36 in combination with Fig. 2. When read in full, this passage disputes the position of the Office Action.

This passage on col. 6, lines 19 to 36 explicitly states that the illustration of Fig. 2 shows the data structure of the data packet, whereby Fig. 2 "shows the data for a transmission channel K1 or K2." (col. 6, lines 31-32). That is, the data for K1 or the data for K2 is transmitted, not the data for both K1 and K2. As a consequence, a data packet is formed for each channel. Fig. 3, however, shows the data structure for the entire radio message (col. 4, line 59).

According to col. 6, lines 19 to 36, each data packet, i.e. the data packet for K1 or the data packet for K2, is split into an implicit element IM_T and an explicit element EX_T. The implicit element IM_T contains the information or data relating to the length, reception address, transmission address and the most significant bit element MSB of a counter. The explicit element EX_T contains the least significant bit element LSB of the counter, the button information and the redundant value. The two elements IM_T and

EX_T within the data packet of K1 provide the logic link to K1 and the two elements IM_T and EX_T within the data packet of K2 provide the logic link to K2.

According to Fig. 3 (in combination with col. 6, lines 19 to 67; col. 4, line 59) only the implicit element of each data packet is transmitted via the radio link. Hence, the explicit element EX_T of K1 containing the least significant bit element LSB of the counter, the button information and the redundant value, with regard to K1, is transmitted, and the explicit element EX_T of K2 containing the least significant bit element LSB of the counter, the button information and the redundant value, with regard to K2, is transmitted. As a consequence, according to the Examiner's opinion, the combination of these two explicit elements within one data packet would involve two redundant values. However, Rumpler does not disclose a combination of these two explicit elements within one data packet. In contrast, Rumpler discloses that each data packet has one added redundant value (e.g. claim 2 or 11).

The respective implicit element of each of the two data packets is known at the receiver and hence, the entire logical link to K1 and the entire logical link to K2 can be again provided.

As it is explicitly described on col. 6, lines 19 to 67, the data packet assigned to K1, the explicit element EX_K1, (Fig. 3) is transmitted, and from the data packet assigned to K2, the explicit element EX_K2, (Fig. 3) is transmitted within a radio message via the radio path but not within a single data packet. Such a radio message has a structure or data sequence as shown in Fig. 3. Accordingly, the data sequence transmitted via the radio path comprises a sequence of several data packets, i.e. a first packet FP, a second packet EX_K1, a third packet EX_K2, a fourth packet of safety-relevant data and a sixth packet FP. Therefore, Rumpler does not disclose the conversion of these several data packets into a single process signal that can be used alone for a system-based processing.

Apart therefrom, each processing step for safety-relevant identification of the signal belonging to the channel K1, and the signal belonging to the channel K2 is

performed by two entities VM1 and VM2 or P1 and P2. Hence, any safety-relevant event is identified on the basis of two signals. Accordingly, present claims 1 and 11 further clarifies that Applicants' invention operates on a single-signal basis and Rumpler does not.

Therefore, all the limitations of independent claims 1 and 11 are not disclosed or suggested by Rumpler. Thus, independent claims 1 and 11 are novel and are in condition for allowance. Reconsideration and withdrawal are requested.

Since claims 2-10 and 12-20 depend from the aforementioned independent claims 1 and 11, respectively, those claims are also believed to be in condition for allowance. Thus, reconsideration and withdrawal of the rejections of claims 1-20 are requested.

Regarding the rejection of claims 1, 2, 11 and 15 in view of George, the Office Action confusingly uses different signals taught by George to support the rejections of the above claims. For instance, on page 4 of the Office Action there is reference to the signals 46a and 46b as being the signals redundantly detected, whereas the signals outputted by the processors (20, 21 and 22) would be the control signals. However, in absolute contrast thereto, the signals 46a and 46b are described and referenced by George as "control signals" (e.g. col. 3, lines 11 to 16; col. 4, lines 46 to 50), not signals that are redundantly detected. Moreover, as to rejection of claim 1, (item 4, page 9 of the Office Action) a reference is made to col. 2, lines 52 to 55 and col. 3, lines 25 to 36 as an anticipating reference of redundantly detected signals. However, these passages relate to the processor signals and to a plurality of other signals, not redundantly detected signals.

According to George, the signals of the processors 20 and 22 are passed to the modules 24a and 24b or to the modules 25a and 25b. These modules are interconnected within the modules 23a or 23b to evaluate the signals by voting so that only one signal, i.e. the signal of processor 20 or the signal of processor 22 is put on the

internal data bus (e.g. col. 3, lines 17 to 25). Such a method corresponds to a hot-standby-system, wherein both processors (20 and 22) receive and process all signals, the voting however is performed within the module 23a or 23b. One of the two processors acts as the active output processor (20) and the other processor (22) is in a hot-standby state ready for eventually taking over the process control.

If there is no fault present (col. 4, lines 46 to 61 in combination with col. 3, lines 35 to 44), identical control signals 46a and 46b having the same frequency and phase are supplied to the windings 7 and 9 of the module 30. Together with the arrangement of the windings 7, 8 and 9 this results in a rounding of the signals. However, identical signals are supplied to the windings 7 and 9 of the control module 32 also. As described, the resulting output signal of the module 30 will appear at the terminal 40 being supplied to the load 31 only if the contact 55 of the control relay 33 that is energized by the module 32 is closed, i.e. only if there is no fault present in module 32.

Regarding module 30, there is no system-based processing of a single process signal, as the output signal is directly fed into the load 31, i.e. without any processing. Similarly, the module 32, which drives a control relay 33 having its contact 55 at the output of the module 32, but does not perform any processing of the output signal. Also, to feed the output signal of the module 30 to the load, the contact 55 of the module 32 must be closed. Both modules 30 and 32 directly feed their output signal to a "final element", i.e. to the load 31 or to the control relay 33, without any processing. Therefore, even for controlling or switching the load 31, again two signals are necessary which have to be combined.

Summarizing, the voting within the modules 23a and 23b is not a conversion of two process signals into a single process signal, as the modules 23a and 23b only perform a choice between two identical signals. If a fault occurs, none of the signals are transmitted for the correct signal of the processor, which is in the hot-standby state, is transmitted. During the further process, two redundant signals (46a and 46b) from modules 26a and 26b are fed to module 30 and two redundant signals (46a and 46b)

from modules 27a and 27b are fed to module 32. At the output of each module 30 and 32 a single signal is directly fed without any system-based processing to a final element. The output signal of module 32 only effects the closing of the contact 55 and the output signal of module 32 only effects the controlling of the load, but only if contact 55 is closed.

Even with regard to the module 32, assuming its output signal would be interpreted as being a converted single process signal on the basis of which a system-based processing is performed via the control relay 33 and the contact 55 at the output of module 30, it must be noted that a redundant combining takes place as the contact of the control relay is again combined with the output signal of module 30. As a consequence, a single signal is not in a position to be processed on its own or to control the load.

George does not disclose a conversion into a single process signal that can be used alone for a system-based processing. Thus, throughout the transmission path redundantly detected process signals are not converted to a single process signal.

Therefore all the limitations of claims 1 and 11 are not disclosed or suggested. Claims 1 and 11 are in condition for allowance. Reconsideration and withdrawal are requested.

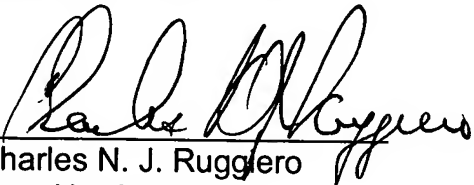
Since claims 2 and 15 depend from the aforementioned claims 1 and 11, respectively, those claims are also believed to be in condition for allowance. Reconsideration and withdrawal are requested.

In view of the above, it is respectfully submitted that the present application is in condition for allowance. Such action is solicited. If for any reason the Examiner feels

that consultation with Applicants' attorney would be helpful in the advancement of the prosecution, the Examiner is invited to call the telephone number below.

Respectfully submitted,

May 7, 2007


Charles N. J. Ruggiero
Reg. No. 28,468
Attorney for Applicant(s)
Ohlandt, Greeley, Ruggiero & Perle, L.L.P.
One Landmark Square, 10th floor
Stamford, CT 06901-2682
Tel: (203) 327-4500
Fax: (203) 327-6401